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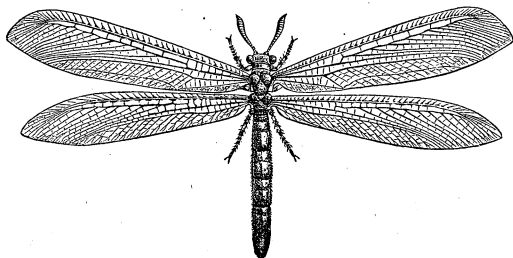
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THE ANT LION.

BY J. H. EMERTON.

Fig. 159.



Ant Lion, adult.

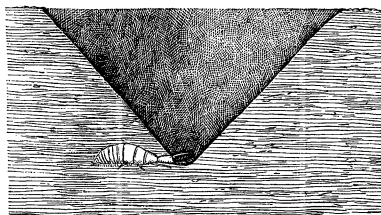
ON the twenty-ninth of August, while hunting spiders among the rocks on the hill north of Bartholomew's pond in South Danvers, Mass., I unexpectedly found the pit of an ant-lion (*Myrmeleo immaculatus* De Geer), in a clear space under the shade of a large boulder. The pit (Fig. 160) was about two inches in diameter and one deep. The insect himself was hid at the bottom, but when I dropped bits of earth into the hole he showed his position by throwing up sand. I then dug him out and took him home with me, where I put him into a bowl of dry, coarse sand, such as is used by masons for mortar. He remained buried for several days, but finally came to the surface, dug his pitfall, and gave me

an opportunity of observing his habits. Fig. 161 represents the ant-lion at this time, showing the under side with the feet in a natural position. At first he was so timid that as soon as any one approached he stopped where he was and remained motionless until left alone. If his pitfall was destroyed he dug a new one; but during all the time I kept

Fig. 161.



Fig. 160.



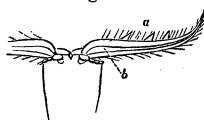
Ant-lion.

him I never saw the whole process of digging it.

When taken out of the sand and laid on the surface he would keep quite still for a few mo-

ments, then retreat backward, by jerks, under the sand. He never moved forward but always backward by the contractions of his abdomen as much as by his feet, making a furrow through the sand. He seldom travelled an inch in one direction, and often made a complete circle in that distance. I think he commenced his pitfall by making a circle of this kind, and afterward throwing out the sand from the centre. In digging he used his flat head and jaws, which were pushed under several grains of sand and then jerked upward, throwing their load sometimes as far as six inches, and always far enough to avoid leaving a ridge around the pitfall. When the pit was finished he was entirely concealed beneath it, as in Fig. 160, except his jaws, which were spread apart horizontally at the bottom. The surface of the pit being as steep as the sand could be piled up was very easily disturbed, and when an insect ventured over the edge the ant-lion was apprised of it at once by the falling sand. He immediately began to throw up sand from the bottom, deepening the pit and so causing the sand to slip down from the sides and the insect

Fig. 162.



with it. The ant-lion seized it with his long jaws and held it up above his head until he had sucked all he wanted from it, when he threw the remainder out of the hole and repaired the trap. Fig. 162 (from Westwood), shows the structure of the jaws, and how the ant-lion may drink the juices from an insect without bringing it to his mouth. On the under side of each jaw (*a*), is a groove (*b*), extending from one end to the other, and partly filled by the slender maxilla which lies in it, forming a tube, one end of which passes into the insect which is bitten, while the other opens near the mouth of the ant-lion. After eating he became more timid, and sometimes would not take a second insect. If, however, several were put into the pit at once, he would bite one after the other until all were killed, before deciding on which to begin. I fed him two or three times a week, usually with house-flies, cutting their wings off and letting him take them in his own way. In October, having occasion to travel some distance, I put him in an ounce bottle half filled with sand, corked him up, and carried him with me in my bag. In about a week I gave him a large house-fly, which he did not catch, not having room enough in the bottle to make a pitfall. I gave him no more food till the next March. Meanwhile he remained for several months on a shelf in my room. Occasionally I tipped him out and always found him lively enough to right himself if turned on his back, and to retreat under the nearest sand. In January he was packed up in my trunk for more than a week, and when I opened it, after it had remained several days in a warm room, I found him as lively as when first caught. He afterwards became quite torpid again in a cold closet, where he remained through the rest of the winter. About the first of March, when flies began to be plenty, I commenced to feed him again. He found it rather awkward to catch insects in the bottle as there was not room enough to make a pitfall, and his inability to move forward made it hard for him to seize an insect unless he met it directly between his jaws.

He soon, however, made pitfalls half an inch in diameter, which answered the purpose. Sometimes he lay on the surface of the sand with a few grains scattered over his back to conceal him from notice, and his jaws extended on the surface. If a fly was put into the bottle it would circle around close to the glass and usually run over the ant-lion's back. He would jerk up his head and attempt to seize it, which he seldom succeeded in doing the first time. If he caught a leg or wing he was unable to move nearer and shorten his hold, and the fly escaped. He would often throw up the sand and try to undermine the fly. He would sometimes work an hour in these ways before the fly would get into a favorable position. I fed him every day or two until May 15th, when he spun a spherical cocoon (Fig. 161*a*) around him, and remained enclosed until June 25th, a very hot day, when he came partly out, and leaving his pupa skin half in the cocoon appeared as a perfect fly (Fig. 159), but did not spread his wings completely.

THE RESOURCES AND CLIMATE OF CALIFORNIA.

BY REV. A. P. PEABODY, D.D.

THE thought uppermost in my mind, during a recent visit to California, was of gratitude to the bravely patriotic men, who, in the late rebellion, at the risk of their own lives saved this great state for the Union.

One who has not been in California can hardly appreciate the magnitude of the threatened loss. The state might easily have maintained her independence, not only of her sister republics, but of all the world beside. It is potentially a self-sustaining empire. Exceeding in the aggregate of its territory the British Islands, it extends through all the degrees of latitude which are identified with a genial climate,